“The Road Ahead: SC Water Resources Possibilities for the SC Coast ”

Presented by
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APPLIED TECHNOLOGY & MANAGEMENT, INC.

What do all these SC coastal regions have in common for the Road Ahead?

Development!

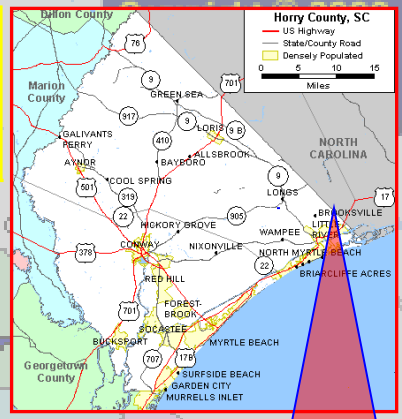
Population!

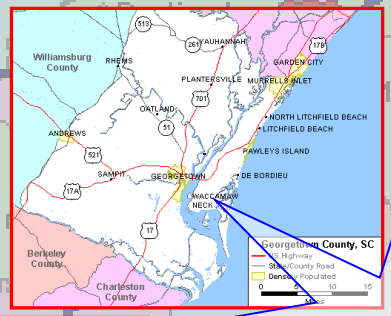
Hurricanes!

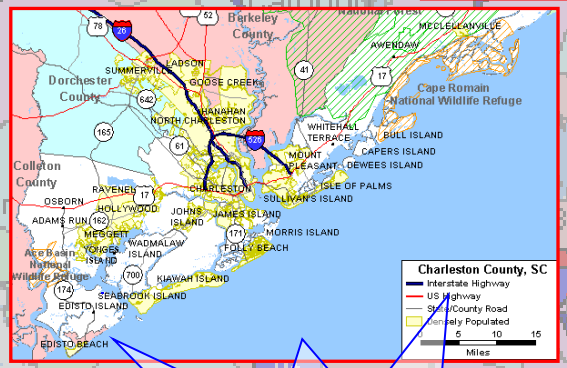
Beaches, Boats, & Waterway Demands!

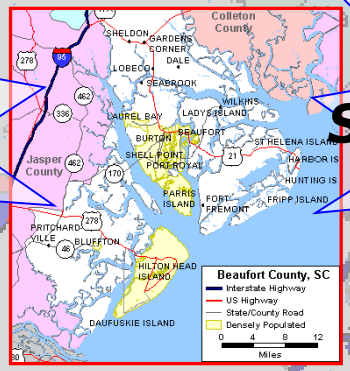
Sea Level Rise!

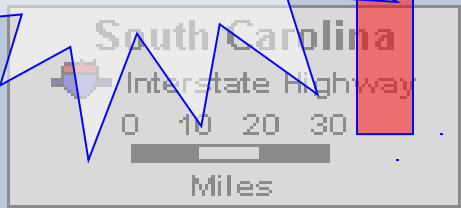
Erosion!



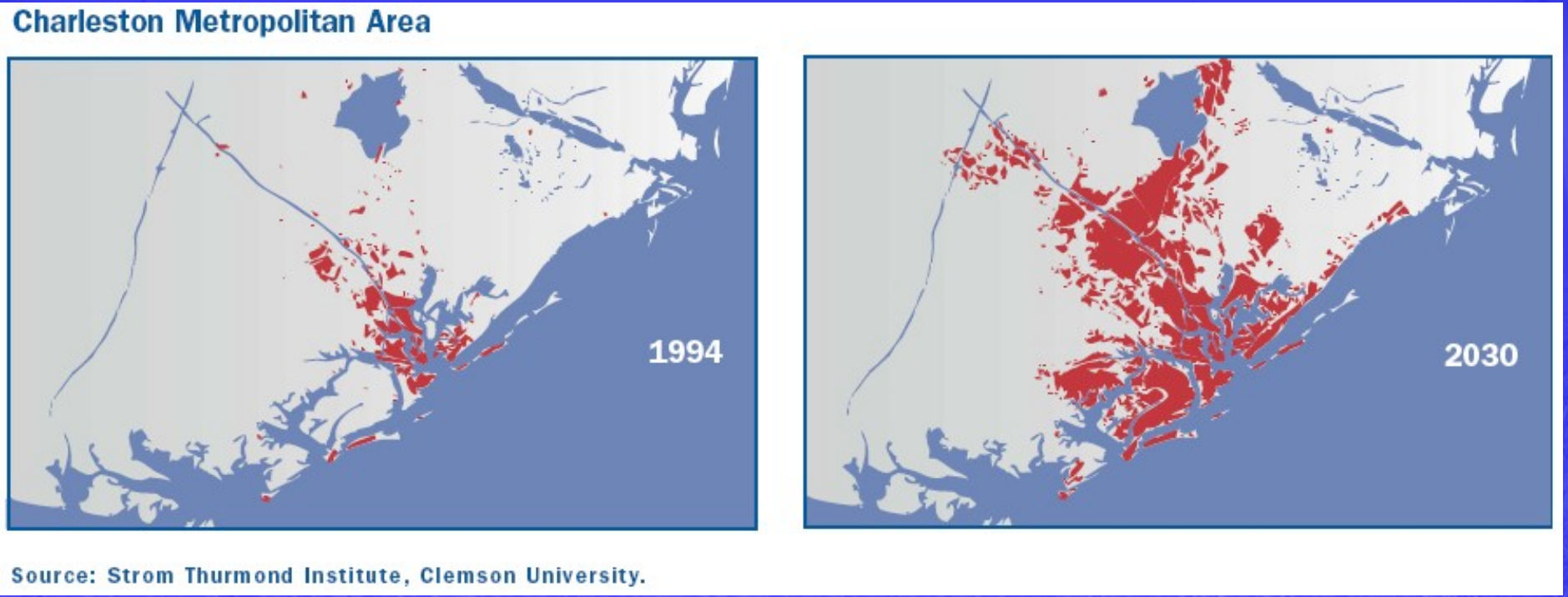






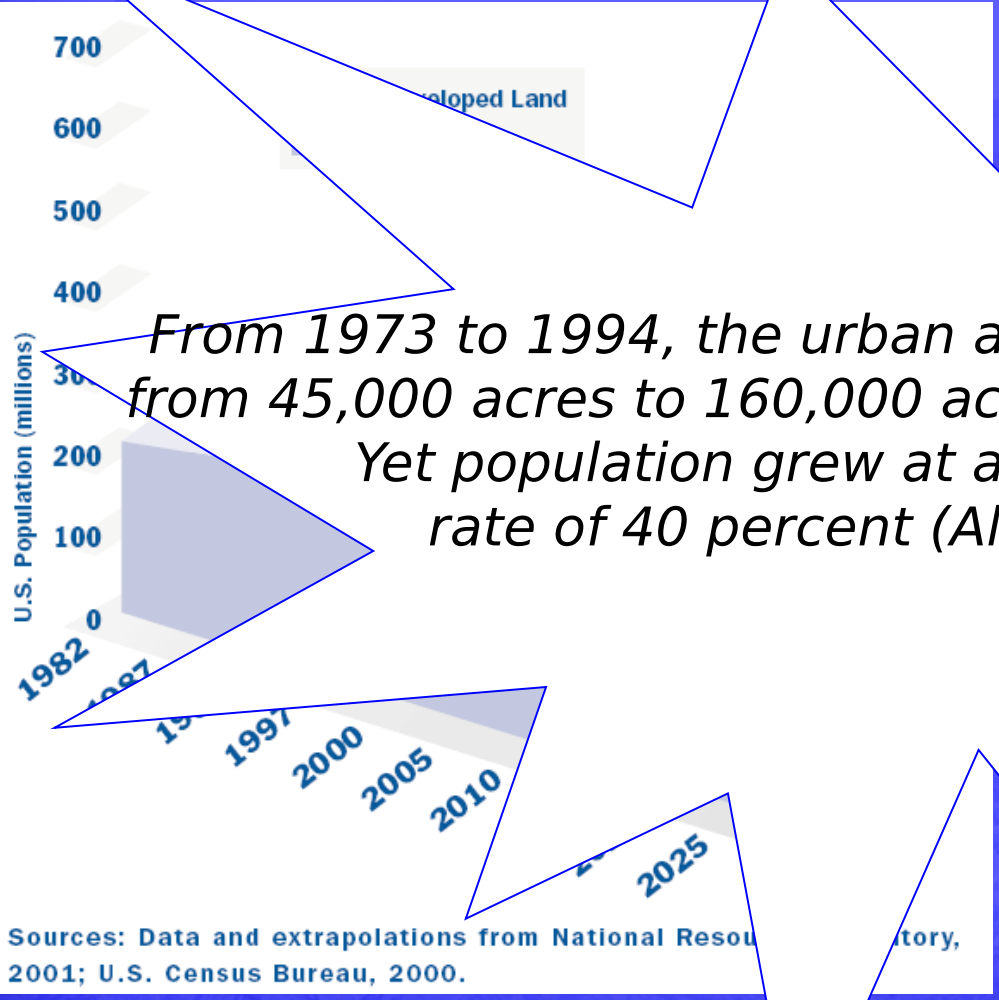


Development



"The Charleston area will grow from its 1994 size of 165,000 acres to two-and-a-half times that size by the year 2030. Charleston will cover 550,000 acres—an area larger than the metropolitan area of Charlotte, North Carolina. A comparatively modest 50 percent increase in population will drive this expansion."

Development & Population



Sources: Data and extrapolations from National Resou tory, 2001; U.S. Census Bureau, 2000.

From 1973 to 1994, the urban area of Charleston expanded from 45,000 acres to 160,000 acres—a 250 percent increase. Yet population grew at a much more modest rate of 40 percent (Allen and Lu, 2000).

Between 2000 and 2025, the U.S. population is projected to grow by 22 perce If the rela hip between land u population in the ues, million today ly age— land Wyo —will a match th amount of l developed from the founding of the country until 1983."

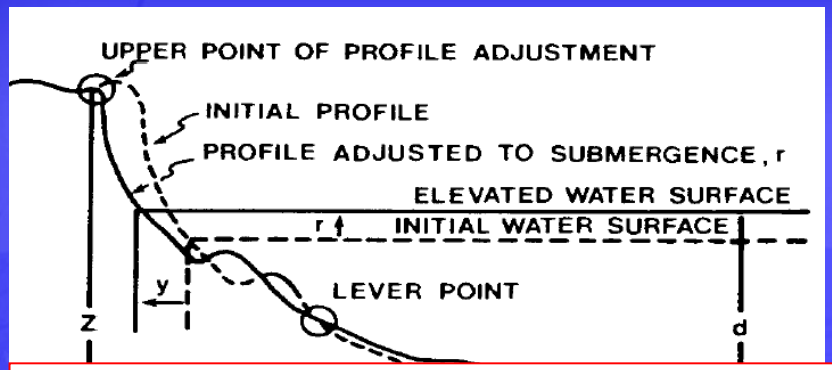
Impacts of Development & Population Growth

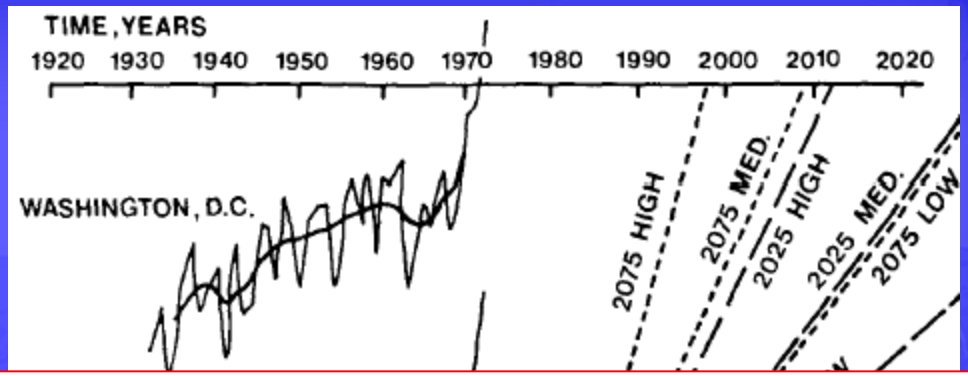
- *Per capita,* ***coastal residents are consuming more land, driving more, boating more, and generally using more resources than they were 30 years ago****. Although this is true nationally, it is exaggerated on the coast, which is wealthier than the nation as a whole. In 1994, 18 of the top 20 counties ranked by per capita income were coastal counties (Culliton, 1998).*

- *Abundant research on rivers and estuaries confirms that* ***when impervious surfaces cover more than ten percent of a watershed, the rivers, creeks, and estuaries they surround become biologically degraded****. If today's growth trends continue, many healthy watersheds will cross that threshold over the next 25 years and the U.S. will experience sharp and irreversible declines in the health of coastal waters.*

- *Recent research in small watersheds around Charleston, South Carolina, draws similar conclusions.* ***When impervious surfaces exceed 15 to 20 percent, the variety and abundance of food available for juvenile fish is significantly reduced*** *(Holland et al., 1996).*

Sea Level Rise





The most widely assessed effects of future sea level rise are inundation, erosion, increased flooding, and salt water intrusion. Park, et al. (1986, 1989) estimated that a two- to seven-foot rise in sea level would result in a 50-90 percent loss of U.S. wetlands. Although erosion is more difficult than inundation to predict, applications of the Bruun (1962) rule and other simplified procedures suggest that a one-foot rise in sea level would erode the shore 50-100 feet in New Jersey (Kyper and Sorensen 1985) and Maryland (Everts 1985); 100-200 feet in South Carolina(Kana et al. 1984); 200-400 feet in California (Wilcoxen 1986); and 100-1000 feet in Florida (Bruun1962). Flooding would increase both because storm surges would have higher bases to build upon (Kana et al. 1984; Leatherman 1984) and because rainwater would drain more slowly (Titus et al. 1987). Warmer temperatures could increase the frequency and severity of hurricanes 50 percent (Emmanuel 1988), increasing both erosion